

# 广西东部早泥盆世晚期盔甲鱼类一新属<sup>1)</sup>

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**摘要** 描述了产自广西东部平乐下泥盆统贺县组的一脊椎动物群中的无颌类化石,建立了盔甲鱼类的一新属、新种——平乐圆盘鱼(*Discaspis pinglensis* gen. et sp. nov.). 圆盘鱼鳃囊数目多达32对。同层产出的尚有保存较完好的胴甲鱼目中华鱼科化石。该动物群的发现为华南区早泥盆世晚期脊椎动物群的演化及其生物地层的对比提供了重要依据。

**关键词** 广西,早泥盆世,脊椎动物

**中图法分类号** Q915.861

## 1 前言

1980年张振贤及其同事在野外工作期间,于广西平乐县源头圩下泥盆统上部的贺县组发现了无颌类盔甲鱼类化石。1984年本文第一作者与张振贤等再次前往化石产地(见图1)进行采集并测制剖面,在贺县组的黄色粉砂岩内不但采到了保存完整的无颌类化石,而且发现了与之共生的保存较为完整的胴甲类鱼化石。胴甲鱼类化石已被描述发表(Ritchie et al., 1992),定名为 *Dayaoshania youngi*(图版II, 3)。王士涛(1991)曾将该动物群称为 Unnamed Paleocommunity 古脊椎动物群落。鉴于目前二者已被正式描述发表,本文将该动物群命名为 *Discaspis pinglensis*-*Dayaoshania youngi* 脊椎动物群落。

## 2 地层简介

广西北部贺县一带的下泥盆统由下而上划分为:石桥组、贺县组及信都组的下段,其上为中泥盆统的信都组中上段和“东岗岭灰岩”。石桥组命名地点位于苍梧县的石桥镇至梧州市的公路旁,其岩性主要为紫色夹绿色的碎屑岩,其中含植物化石 *Zosterophyllum yunnanicum* Hsu 和 *Taeniocrada dechenina* (Goepf). 由所含植物化石来看,石桥组可以与云南曲靖翠峰山群的西屯组—桂家屯组对比。因此,贺县一带极可能缺失相当于翠峰山群下部的西山村组及部分西屯组的沉积。

贺县组命名点位于广西贺县的信都。在信都剖面,贺县组岩性主要由紫色、灰绿色泥

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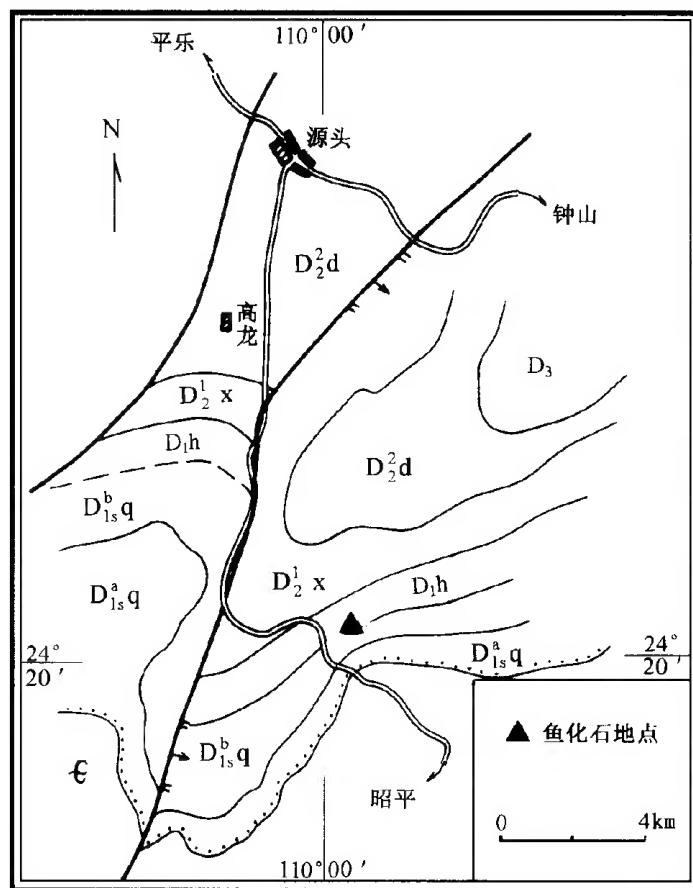


图1 化石产地位置

Fig.1 The locality of vertebrate fossils

e 寒武系 (Cambrian), D 泥盆系 (Devonian),  $D_{1s}^a q$ ,  $D_{1s}^b q$  石桥组 (Shiqiao Fm.) a, b 段,  $D_{1h}$  贺县组 (Hexian Fm),  $D_2^x$  信都组 (Xindu Fm.),  $D_2^d$  东岗岭组 (Donggangling Fm.),  $D_3$  上泥盆统 (Upper Devonian)

岩及粉砂岩组成,底部含计氏云南鱼 (*Yunnanolepis chii* Liu) 及多鳃鱼的碎片。本文描述的无颌类化石产于平乐县源头圩的贺县组底部,到目前为止,尚未在该地层中发现海相无脊椎动物及陆生植物化石。因此,贺县组的时代只能由上覆地层的时限加以推断。在贺县组的命名剖面中,贺县组之上的信都组除产有信都贺县鱼 (*Hohsienolepis hsintuensis* Pan) 之外,尚产有三叶虫化石 *Fuscinipyge hexaspis* (Xiang),可大致与象州大乐泥盆系剖面的大乐组六回段对比。鉴于此,信都组应包括早泥盆世晚期艾姆斯期的沉积,而贺县组的时代大致相当艾姆斯期早期。

贺县及平乐一带的泥盆纪古地理位置位于大瑶山隆起(古陆)北侧,在早泥盆世艾姆斯期,可能属于泻湖环境(王士涛,1991)。由于水动力强度低,因此沉积物主要为纯净的粉砂质和细砂质,其中所含脊椎动物遗体并未受到强烈的冲刷及毁坏,绝大部分以较完整的个体原地埋藏于沉积层内。

### 3 化石描述

无颌类 Agnatha

盔甲鱼纲 Galeaspida

多鳃鱼亚纲 Polybranchiaspida

都匀鱼目 Duyunolepidida Pan & Wang 1978

都匀鱼科 Duyunolepidae Pan & Wang 1978

圆盘鱼属(新属) *Discaspis* gen. nov.

词源 Disc(L)圆盘之义。

属型种 平乐圆盘鱼(*D. pinglensis* gen. et sp. nov.)。

**特征** 头甲略呈圆形。吻缘圆钝,后角呈短叶状,不具后中突,鼻垂体凹为纵长的卵圆形,眶孔中等大小,圆形。鳃区具有 32 对紧密排列的鳃囊。感觉沟系统为多鳃鱼类型,两侧的主侧线沟由中横枝联络,每侧具 5 条侧横枝,其末端分叉,两条主侧线沟的后外侧各具一弧形感觉沟。

**比较与讨论** 按 Janvier (1996) 的观点,除了真盔甲鱼目和汉阳鱼目外,所有发现于中国和越南北部的盔甲鱼类化石均包括在多鳃鱼亚纲(Polybranchiaspida)内。除少数属种发现于志留纪外,其余属种均发现于泥盆纪,尤以早泥盆世为主(朱敏等, 2000a, b)。中泥盆世目前仅发现于滇东北中泥盆统的缩头山组(王士涛等, 1984),而晚泥盆世仅宁夏中宁一个未定属种(潘江等, 1987)。由此可以得出初步结论,即多鳃鱼类主要发育于华南区志留纪—早泥盆世时期。都匀鱼目当前仅有一都匀鱼科,该科共包括 3 个属:都匀鱼属(*Duyunolepis*)、副都匀鱼属(*Paraduyunaspis*)及新都匀鱼属(*Neoduyunaspis*)。都匀鱼属的属型种包阳都匀鱼(*P. paoyangensis* Pan & Wang)的鳃囊数目为 21 对,赫章副都匀鱼(*P. hezhangensis* Pan & Wang)鳃囊的数目则为 24 对,但小型新都匀鱼属(*N. minor* Pan & Wang)鳃囊数目仅为 15 对。因此,本文作者认为小型新都匀鱼并不属于都匀鱼目,而应属于多鳃鱼目。至于本文描述的平乐圆盘鱼的鳃囊数目多达 32 对,大大超出了潘江(1992)对都匀鱼目特征中描述的鳃囊数目 15~24 对。这里需要讨论的一个问题是,究竟多鳃鱼目的特征是什么?

作者认为如果仅由都匀鱼属的外部形态特征作为分类归属的依据,它们极有可能被归于多鳃鱼目。但是都匀鱼目的建立是依据保存的鳃囊的数目大大超出了多鳃鱼目鳃囊的数目。也就是说,都匀鱼目的主要特征是其鳃囊的数目要超过 15 对。在已了解鳃囊数目的情况下,如果鳃囊超过 15 对,可以将其归入都匀鱼目。鉴于此,作者将潘江等确立的都匀鱼目 15~24 对鳃囊数目修改为 20~35 对或更多。此外,本文描述的新属头甲后部不具有后中突,两侧具有短的叶状胸角。而都匀鱼属的后中突则显著发育,但不具两侧的胸角。因此,如果将本文描述的新属归入都匀鱼目,那么都匀鱼目也将包括多鳃鱼目但又不具有后中突的某些种属。王俊卿等(1994)曾描述过采自滇东北昭通早泥盆世坡松冲组中的属于多鳃鱼目的一个属,让氏昭通鱼(*Zhaotongaspis janvieri* Wang & Zhu),并建立了昭通鱼科(*Zhaotongaspidae*)。让氏昭通鱼的鳃穴数目多达 35 对以上,并且具有向后侧伸展的胸棘,两眶孔位于头甲外侧边缘。仅由后两个特征而论,与本文描述的新属有显著差

别,肯定不是一个属及同一个科。王俊卿等(1994)虽然认为昭通鱼科与都匀鱼科之间具有许多相似特征,有较近的亲缘关系,但他们将昭通鱼科归于多鳃鱼目。由此可见,在多鳃鱼亚纲的分类中,目前仍保存不同意见,有待商榷和统一。

新属的鼻垂体凹为纵长卵圆形,而在多鳃鱼亚纲中绝大多数的多鳃鱼类的鼻垂体凹为横宽的卵圆形,目前仅有盾形五孔鱼(*Pentarospis pelta* Pan)(潘江,1992)及耿氏鸭吻鱼(*Gantarostrataspis geni* Wang & Wang)(王俊卿等,1992)的鼻垂体凹为纵长的卵圆形。

新属的感觉沟系统为多鳃鱼型,但其主侧线沟的外侧后方各具一条向前弯的感觉沟,本文称之为弧形感觉沟(cur, curved sensory canal),在 GMCV1955-1.2 标本中该感觉沟保存并不完整,因此它可能是主侧线沟后部的一种变异。该感觉沟在多鳃鱼类其他各属中尚未见到。

### 平乐圆盘鱼(新种)*Discaspis pinglensis* gen. et sp. nov.

(图 2; 图版 I, 1~3; 图版 II, 1~2)

**词源** pingle 为平乐县的汉语拼音。

**正型标本** 一完整头甲化石的内颅及其外模(中国地质博物馆化石编号: GMV1952-1, 2)。

**副型标本** 一完整头甲化石,其中部及后部保存较好, GMV1953。

**其他材料** 一不完整头甲前部,右侧感觉沟保存较好, GMV1954; 一不完整头甲前部的内外模,右侧感觉沟保存完好, GMV1955; 一件不完整的头甲,其吻缘略向前突, GMV1956。

**产地与层位** 广西平乐县源头圩,下泥盆统,贺县组。

**特征** 同属。

**描述** 头甲的外部形态特征:正型标本 GMV1952 为一件近于完整的头甲,略呈卵圆形,吻缘稍向前拱,但未形成明显的吻突。头甲的长/宽之比为 1.12:1。后侧缘发育一对很短的叶状胸角,但未形成类似昭通鱼的胸棘。头甲后缘向前凹进,不具有类似都匀鱼所有的后中突。头甲背部中线位置由中背甲后部向后明显隆起形成中背脊(图版 I, 1a, b),近似云南曲靖西山村组的曲靖东方鱼(*Dongfangaspis qujingensis* Pan & Wang)(潘江等, 1981, 图 5)。本文描述的其他标本的长/宽之比为 1.16~1.12:1,说明头甲的长仅稍大于宽。头甲的最宽处位于中部。

位于头甲背部的鼻垂体凹大,为纵长的卵圆形。正型标本的长/宽之比为 1.25:1,其他标本的鼻垂体凹的长/宽之比为 1.21~1.4:1,其前缘接近头甲的前缘。鼻垂体凹位于头甲的前部。眶孔背位,中等大小,呈圆形,位于鼻垂体凹之后,两眶孔之间的距离较宽,正型标本的眶孔间距为 26mm,而 GMV1955 则为 28mm。松果孔为于两眶孔后缘连线稍后,位于头甲全长的前半长 1/4 处。

在采集到的标本中,头甲上的感觉管系统是以感觉沟的形式呈现在标本上面。这是由于感觉管位于骨质层的表层下面,而骨质层的表面被风化剥蚀后,感觉管也随之被破坏而保存了感觉管所造成的沟状痕迹,即感觉沟。因此,本文均以感觉沟系统来描述。由保存的感觉沟分布来看,其形态为多鳃鱼类型。眶上沟呈“V”字型分布于松果孔的两侧,在

眶孔的前缘通过并与眶下沟相连通向头甲的侧缘。眶下沟由眶孔的腹缘通过眶孔的后缘向后与头甲的主侧线沟相连接。主侧线沟呈波状分布于头甲的两侧,其间由一波状的中横联络枝相连。在该联络枝上具有向后伸出的两枝垂直于中横联络枝的短枝。每侧的主侧线沟均具有 5 条伸向头甲侧缘的侧横枝,其末端均分叉。在两条主侧线沟的腹侧后部,各具一枝向中背部弯曲的弧形感觉沟。由于 GMV1955 标本后部残缺,该弧形感觉沟及主侧线沟的后部是相互连接还是各自独立伸向后方,目前尚不能肯定。

头甲的腹部在所采集的标本中均未出露,但腹环则清晰地呈现在大部分标本中。腹环较宽,腹部鳃孔的痕迹清晰。

头甲的内颅结构:由于化石保存条件所限,在所有标本中均未见及脑部及中枢神经保存的痕迹。但鳃器保存得完整而清晰,尤其在正型标本 GMV1952 中,鳃区两侧的鳃囊印痕保存得很完整,鳃囊长而且狭窄,共 32 对,彼此之间排列非常紧密,几乎见不到鳃间嵴的痕迹。每侧鳃囊前后者均较短,最短者位于后部。前部的鳃囊向前外侧方伸出,与中轴夹角为  $45^\circ$ ,中部的与中轴近垂直,而后部的鳃囊则向后外侧方伸,与中轴以  $45^\circ$  角相交,最长的鳃囊位于鳃器中部。两侧鳃器之间的围心区(包围心脏区)长大于宽。在鳃器的外侧保存有与鳃囊数目相等的圆形小突起或凹陷,均位于头甲腹环的内边缘。他们应该是每个鳃囊外口固着在腹环边缘上留下的痕迹。潘江等(1978)称之为外鳃腔或称之为发散管。

本文所描述的头甲其齿质层均被风化剥蚀,因此目前我们观察到的纹饰为表面纹饰留下的印痕而不是表层的真正纹饰。既使如此,我们仍可在头甲上残留下的小骨片上清楚地辨认出头甲表面是由众多的星状小骨片组成,其基部未愈合。腹环上的小骨片较头甲背面的稍小。

测量数据见表 1。

表1 平乐圆盘鱼(新属、新种)头甲测量

Table 1 Measurements of cephalic shield of *Discaspis pinglensis* gen. et sp. nov (mm)

	GMV1952	GMV1953	GMV1954	GMV1955	GMV1956
头甲全长(Total length of cephalic shield)	94.5	80	80.6		
中长(Median length of cephalic shield)	88.2	78			
最大宽度(Maximum width of cephalic shield)	83.7	67	76		
松果孔至吻缘长度(Length from pineal opening to rostral margin)	22.2	22.2	21.6	29.5	24
松果孔至后缘长度(Length from pineal opening to posterior margin)	66	55.8			
鼻垂体凹长度(Length of nasohypophysial fenestra)	13.2	12	11.2	14.5	10.5
鼻垂体凹宽度(Width of nasohypophysial fenestra)	10.5	9	8.8	9.5	8.3
眶孔长度(Length of orbit)	5	5.2	4.5	5	5
眶孔宽度(Width of orbit)	5	5.7	4.5	5	5.5
两眶孔之间的距离(Distance between two orbits)	26	25	26	28	22

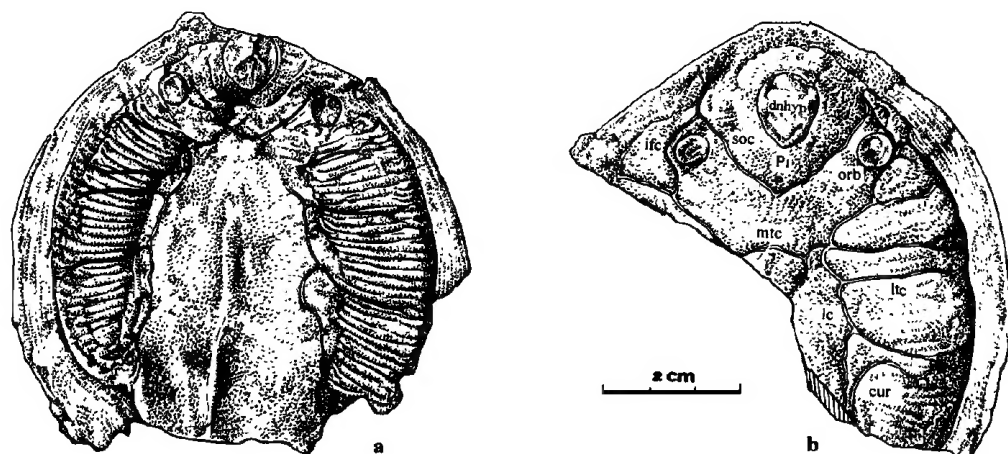


图2 平乐圆盘鱼(新属、新种) (*Discaspis pinglensis* gen. et sp. nov.) 头甲素描

Fig.2 Sketch of cephalic shield of *Discaspis pinglensis* gen. et sp. nov.

a. GMV1952-1; b. GMV1955-1

cur. curved sensory canal 弧形感觉沟; dnhyp. nasohypophysial depression 鼻垂体凹; ifc. infraorbital canal 眶下沟; lc. main lateral canal 主侧线沟; ltc. latero-transversal canal 侧横枝; mtc. medio-transversal commissure 中横联络枝; orb. orbital 眶孔; Pi. pineal opening 松果孔; soc. postorbital canal 眶上沟

#### 4 多鳃鱼类的时空分布及其生态环境

多鳃鱼类(polybranchiaspids),正如前文所述,系指除真盔甲鱼类和汉阳鱼类以外所有的盔甲鱼类,它们的化石在我国华南地区分布甚为广泛,尤其是早泥盆世早—中期几乎达到繁盛的顶峰。根据目前的统计,其中绝大多数的多鳃鱼类分布于云南曲靖的西山村组,其次分布于贵州的乌当组及丹林组的上部。本文描述的平乐圆盘鱼产于广西平乐的贺县组,也是多鳃鱼类最集中的地区之一。上述三个地区在早泥盆世时均处于海盆的边缘,而且又均与广海海盆之间存在一定的障壁,但又处于两者相通的古地理环境(图3)。另外,在新疆柯坪和巴楚地区早志留世(王俊卿等,1996)和宁夏中卫晚泥盆世(潘江等,1987)地层内也有发现。

曲靖西山村组为一套滨海相的细粒砂质并夹有少量的粉砂质及泥质的沉积。由于沉积区与外海之间有障壁相隔(王士涛,1986),风浪很难侵入,因此本组沉积相当稳定,未见大型的斜交及楔状层理,层面上亦未见有波状构造。在本组中部的一层灰白色细砂岩的层面上保存有完整的曲靖东方鱼(*Dongfangaspis qujingensis* Pan & Wang)及硕大云南盔甲鱼(*Yunnanogaleaspis major* Pan & Wang)(潘江等,1980,1981),但未见其他种类脊椎动物化石。西山村组含有几丁虫及疑源类化石(方润森等,1985),证实该组为靠近海滨稳定环境下的泻湖相的沉积(王士涛,1991)。

贵州赫章铁矿山及都匀、包阳等地的早泥盆世晚期(早艾姆斯期)的沉积,均为含铁质

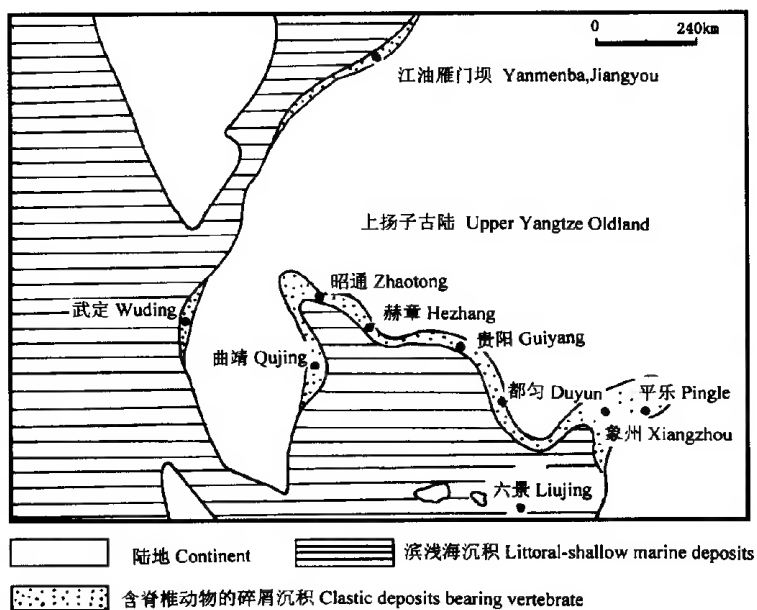


图3 华南早泥盆世无颌类分布略图

Fig.3 Sketch map showing the distribution of agnathans in the Early Devonian of South China

的还原环境,所发现的多鳃鱼类 *Duyunaspis paoyanygensis* 和 *Paraduyunolepis hezhangensis* 虽为不同属种,但属于同一科(潘江等,1978)。但在贵阳乌当,乌当组为暗紫红色的泥质沉积,其顶部除含多鳃鱼类的 *Neoduyunaspis minor* 以外,尚有节甲鱼类的 *Kueichowlepis sinensis*、大瓣鱼类的 *Sinopetalichthys kueiyangensis* 以及胴甲类、总鳍鱼类等化石(潘江等,1975,1978)。由上述种属分析,乌当组的时代应归入早西根期(王士涛,1991)。

目前在四川北川桂溪剖面下泥盆统中尚未发现多鳃鱼类化石,但在江油的雁门坝下泥盆统平驿铺群上部却含有具长吻突的多鳃鱼类化石 *Longmenshanaspis kangyouensis*、*Sinoszechuanaspis yanmenpaensis*、*Sanqiaspis rostrata*。在广西象州大乐剖面下泥盆统大瑶山群的中部曾发现无颌类化石的碎片,可能属于多鳃鱼类。刘时藩(1986)曾在象州大乐剖面下泥盆统小山组中采到具吻突的盔甲鱼亚纲化石 *Tridentaspis magnoculus* Liu,与胴甲类中属于中华鱼科的 *Dayaoshania youngi* Wang 共生,同时尚发现节甲鱼类的 *Kueichowlepis daleensis* Wang(王士涛,1991)。广西六景下泥盆统莲花山组中以胴甲鱼类为主,但在那高岭组则含有具吻突的多鳃鱼类,宽展亚洲鱼 *Asiaspis expansa*(潘江等,1978)。

在多鳃鱼类的时空分布中,我们发现了一个饶有兴趣的生态群落问题,譬如在西山村组中我们从未发现具有吻突的多鳃鱼类,而在含有亚洲鱼的那高岭组也尚未发现其他的不具吻突的多鳃鱼类。此外,在平乐的贺县组、都匀的丹林组上部亦未见具有吻突的多鳃鱼类;而在江油雁门平驿铺群上部产有6个属种的多鳃鱼,均为具有吻突的分子,但很少见不具吻突的多鳃鱼类。这一现象不仅与其出现的时代早晚有关,即时代较早的不具吻突,而时代较晚的不仅有吻突而且胸角也发育(王俊卿,1984,朱敏等,1994)。至少在早泥

盆世和中泥盆世早期是如此,到了晚泥盆世时个体大了,但吻突和胸角却没了。这不仅与时代有关,也可能与生态环境有密切的联系。

至于鳃囊数目的多少是与生态环境有关还是与其他因素有关,目前尚不清楚,有待今后进一步研究。

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## A NEW GENUS OF GALEASPIDA FROM THE LATE EARLY DEVONIAN OF EASTERN GUANGXI, SOUTH CHINA

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**Key words** Guangxi, late Early Devonian, Vertebrates

### Summary

The late Early Devonian vertebrate fossils including antiarchs and polybranchiaspids were collected from Yuantou Valley, Pingle County of Eastern Guangxi. The antiarch fossils were named *Dayaoshania youngi* by Wang Shitao in Ritchie et al. (1992), and referred to the Sinolepididae. *Dayaoshania* has no median ventral plate, similar to *Liujiangolepis*, *Xichonolepis* and *Sinolepis* of South China and *Grenfellaspis* of Australia. In this paper the polybranchiaspid fossils are described, and the *Discaspis pinglensis*-*Dayaoshania youngi* Paleocommunity is termed, representing the late Early Devonian Paleocommunity in the Hexian Formation of Guangxi (unnamed Paleocommunity in Wang, 1991).

### Class Galeaspida

#### Subclass Polybranchiaspida

#### Order Duyunolepidida Pan & Wang, 1978

#### Family Duyunolepididae Pan & Wang, 1978

#### Genus *Discaspis* gen. nov.

**Diagnosis** Cephalic shield covered by cycloid carapace with a round rostral margin and without posterior process; posterior corners leaf-shaped; naso-hypophysial fenestra slightly longitudinal round or cycloid; orbits round and middle size; thirty-two pairs of branchial chambers and wide posterior cephalic region ladder shaped; pattern of sensory lines in the dorsal shield with two parallel main lateral canals, one medio-transversal commissure and five latero-transversal canals with the bifurcated ends; a pair of curved sensory canals situating in the main lateral canals postero-laterally.

**Remarks** This new form is similar in general shape to polybranchiaspids *Polybranchiaspis*, *Dongfangaspis* and *Duyunolepis*, particularly similar to *Dongfangaspis* in the sensory lines and developed pectoral corners. It is different from *Polybranchiaspis* and *Dongfangaspis* from Yunnan in its thirty-two branchial chambers. *Discaspis* differs from



*Duyunolepis* in the number of branchial chambers, the curved sensory canals and the absence of the posterior process. *Zhaotongaspis janvieri* (Wang and Zhu, 1994), referred to Polybranchiaspiformes and Zhaotongaspididae, bears thirty-five pairs of branchial chambers like the new genus, but differs in its laterally placed orbits. We refer those polybranchiaspids with 20~35 pairs of branchial chambers to the Duyunaspidida.

**Type species** *Discaspis pinglensis* sp. nov. (pl.I, 1~3; pl.II, 1~2; fig.2)

**Etymology** The genus is from Latin Disca (cycloid), aspis (fish); the species is from the locality-Pingle County.

**Holotype** GMV1952-1, 2, endocranium, dorsal view and its external mould.

**Paratype** GMV1953-1,2, cephalic shield, dorsal view, the branchial region is well preserved.

**Other material** GMV1954, GMV1955-1, 2, GMV1956, the right sensory lines and the median transversal commissure are preserved very well in GMV1955-1 and GMV1955-2.

**Horizon and locality** Hexian Formation, late Early Devonian (Emsian); Yuantou Valley, Pingle County, Guangxi.

**Description** The endocranium, particularly the branchial region is well preserved in the holotype GMV1952, and the large part of the dorsal carapace is preserved in the paratype GMV1953. The reconstruction of the sensory lines is based on the GMV1955 specimen since the right sensory lines and the medio-transversal commissure are well preserved in the GMV1955. In GMV1956 the rostral margin is slightly convex anteriorly. There is no brain trace in any specimen. The measurements of the specimens are shown in Table 1. Cephalic shield is covered by carapace with a round rostral margin and without a posterior process. The posterior corners are leaf-shaped. Orbits are round and median-sized. There are thirty-two pairs of branchial chambers and wide posterior cephalic region in ladder-shaped. A pair of curved sensory canals is situated in the main lateral canals postero-laterally.

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### 图版说明(Explanations of plates)

#### 图版 I (Plate I)

1~3. 平乐圆盘鱼(新属、新种)(*Discaspis pinglensis* gen. et sp. nov.)

1. 正型标本(Holotype)GMV1952, 一完整的头甲, 两侧鳃囊出露清楚(a complete cephalic shield showing branchial chambers of both sides) 1a. 背视(in dorsal view), GMV1952-1,  $\times 0.8$ ; 1b. 头甲外模(natural cast of the cephalic shield), GMV1952-2,  $\times 0.7$ ; 2. 副型标本(Paratype), GMV1953,  $\times 0.85$ , 一完整的头甲, 保存了部分感觉沟, 背视(a complete cephalic shield showing part of sensory line system, in dorsal view); 3. 一不完整的头甲, 保存了右侧感觉沟(an incomplete cephalic shield showing right sensory line system), GMV1955,  $\times 0.8$  3a. 背视(in dorsal view), GMV1955-1; 3b. 背甲外模(natural cast of the cephalic shield), GMV1955-2

#### 图版 II (Plate II)

1~2. 平乐圆盘鱼(新属、新种)(*Discaspis pinglensis* gen. et sp. nov.)

1. 一不完整的头甲, 右侧感觉沟, 背视(an incomplete cephalic shield showing right sensory line system, in dorsal view, GMV1954),  $\times 0.7$ , 2. 一不完整的头甲外模(an incomplete natural cast of the cephalic shield), GMV1956,  $\times 0.8$

3. 杨氏大瑶山鱼(*Dayaoshania youngi* Wang 1992), 示头部, 躯干部以及连在躯干腹甲上的胸鳍(head-shield, trunk-shield and ventral plates of trunk-shield with pectoral fin),  $\times 2$

